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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/065,629	11/04/2002	Roman Chistyakov	ZON-002	4225
23701	7590	10/07/2003	EXAMINER	
RAUSCHENBACH PATENT LAW GROUP, LLC			LEE, WILSON	
P.O. BOX 387			ART UNIT	
BEDFORD, MA 01730			PAPER NUMBER	
			2821	
DATE MAILED: 10/07/2003				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/065,629

Applicant(s)

CHISTYAKOV, ROMAN

Examiner

Wilson Lee

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 November 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24, 26, 31-33, 35-37, 41, 43 and 44 is/are rejected.
- 7) ☒ Claim(s) 25, 27-30, 34, 38-40 and 42 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 November 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the second volume of feed gas, third volume of feed gas, a means for exchanging the strongly-ionized plasma, a gas exchange means for exchanging the weakly-ionized plasma must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections – 35 U.S.C. 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-21, 43 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

In regard to Claims 1, 3, 10, 12 and 43, a second volume of feed gas, a third volume of feed gas, a means for exchanging the strongly-ionized plasma and a means for exchanging weakly-ionized plasma have not been disclosed in the specification to enable one skilled in the art to make or use the invention. Applicant is respectfully

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requested to point out the above limitations shown in the specification if examiner overlooked the disclosure.

Claims 2-9 and 11-21 are vague by virtue of their dependency on claims 1 and 10

Claim Rejections – 35 U.S.C. 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4-11, 19, 20, 22-24, 26, 31-33, 35-37, 41, 43, 44, as best understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Koloc (5,041,760).

In regard to Claim 1, Koloc discloses an apparatus for generating a strongly-ionized plasma, the apparatus comprising:

- an ionization source (18 in figure 1) that generates a weakly-ionized plasma (plasma at the pre-ionization region 62 in figure 8) from a volume of feed gas (from gas source 88 in figure 9);
- a power supply (46) that applies an electrical pulse across the weakly-ionized plasma to generate the strongly-ionized plasma (See Col. 5, lines 1-37, Col. 13, lines 39-59); and
- a means (power supply 80 in figure 9 or high voltage source 16 in figure 1) for exchanging the strongly-ionized plasma with a second volume of feed gas

(from gas source 88 in figure 9) while applying the electrical pulse (intensive pulsed electric field to produce a high stressed voltage condition. See Col. 14, lines 27-56) across the second volume of feed gas to generate an additional strongly-ionized plasma.

In regard to Claim 2, Koloc discloses that the power supply (80 or 16) applies the electrical pulse across the weakly-ionized plasma to excite atoms in the weakly-ionized plasma and to generate secondary electrons, the secondary electrons inherently ionizing the excited atoms, thereby creating the strongly-ionized plasma (See Col. 5, line 53 to Col. 6, line 6.

In regard to Claims 4 and 5, Koloc discloses the power supply inherently generates a constant power and a constant voltage since the power source must constantly generate power or voltage to the ion source in order to generate plasma.

In regard to Claim 6, Koloc discloses that the ionization source is an X-ray source, an electron beam source, or an ion beam source (See Col. 7, lines 3-11).

In regard to Claim 7, Koloc discloses that a magnet (36) that is positioned to generate a magnetic field (flux 34) proximate to the weakly-ionized plasma, the magnetic field trapping electrons in the weakly-ionized plasma.

In regard to Claim 8, Koloc discloses that the magnet comprises an electro-magnet since it receives electricity or plasma from electrode 76 and plasma gun (70) (See Figure 9).

In regard to Claim 9, Koloc discloses the magnet is movable since it is not physically connected to anything shown in figure 9.

In regard to Claim 10, Koloc discloses a method for generating a strongly ionized plasma, the method-comprising:

- ionizing a volume of feed gas (from gas source 88) to form a weakly-ionized plasma (pre ionization region 62 shown in Figure 8);
- applying an electrical pulse (from electrodes 12 and 14) across the weakly-ionized plasma to generate the strongly-ionized plasma; and
- exchanging the strongly-ionized plasma with a second volume of feed gas (from another gas source 88) while applying the electrical pulse (intensive pulsed electric field to produce a high stressed voltage condition. See Col. 14, lines 27-56) across the second volume of feed gas to generate an additional strongly-ionized plasma.

In regard to Claim 11, Koloc discloses that the applying the electrical pulse across the weakly-ionized plasma excites atoms in the weakly-ionized plasma and generates secondary electrons, the secondary electrons ionizing the excited atoms, thereby creating a strongly-ionized plasma (intensive pulsed electric field to produce a high stressed voltage condition. See Col. 14, lines 27-56) (atom excitation. See Col. 5, line 53 to Col. 6, line 6).

In regard to Claim 19, Koloc discloses that the ionizing the feed gas comprises exposing the feed gas to one of a static electric field, an pulsed electric field, UV radiation, X-ray radiation, electron beam radiation, and an ion beam (See Col. 7, lines 3-11).

In regard to Claim 20, Koloc discloses that generating a magnetic field (34) proximate to the weakly-ionized plasma, the magnetic field trapping electrons in the weakly-ionized plasma.

In regard to Claim 22, Koloc discloses that an apparatus for generating a strongly-ionized plasma, the apparatus comprising:

- an anode (12) in figure 8;
- a cathode (14) that is positioned adjacent to the anode and forming a gap there between in figure 8;
- an ionization source (70 in figure 9) that generates a weakly-ionized plasma proximate to the cathode; and
- a power supply (16 in figure 10) that produces an electric field across the gap, the electric field generating excited atoms in the weakly-ionized plasma and generating secondary electrons from the cathode, the secondary electrons ionizing the excited atoms, thereby creating the strongly-ionized plasma (See Col. 5, lines 1-37, Col. 13, lines 39-59).

In regard to Claim 23, Koloc discloses that the power supply inherently generates a constant power since the power source must constantly generate power or voltage to the ion source in order to generate plasma.

In regard to Claim 24, Koloc discloses that the power supply inherently generates a constant voltage since the power source must constantly generate power or voltage to the ion source in order to generate plasma.

In regard to Claim 26, Koloc discloses that the electric field comprises a pulsed electric field (See Col. 14, lines 27-56).

In regard to Claim 31, Koloc discloses that the ionization source is chosen from the group comprising an electrode coupled to an X-ray source, an electron beam source, an ion beam source(See Col. 7, lines 3-11).

In regard to Claim 32, Kolock discloses that a magnet (36) that is positioned to generate a magnetic field (34) proximate to the weakly-ionized plasma, the magnetic field trapping electrons in the weakly-ionized plasma proximate to the cathode.

In regard to Claim 33, Koloc disclose a method for generating a strongly-ionized plasma, the method comprising:

- ionizing a feed gas (from gas source 88 in figure 9) to generate a weakly-ionized plasma proximate to a cathode (14 in figure 8); and
- applying an electric field across the weakly-ionized plasma (See Figure 8) in order to excite atoms in the weakly-ionized plasma and to generate secondary electrons from the cathode, the secondary electrons ionizing the excited atoms, thereby creating the strongly-ionized plasma (See Col. 5, lines 1-37, Col. 13, lines 39-59 and Col. 14, lines 27-56).

In regard to Claim 35, Koloc discloses that the applying an electric field inherently comprises applying the electric field at a constant power since the power source must constantly generate power or voltage to the ion source in order to generate plasma.

In regard to Claim 36, Koloc discloses that the applying-an electric field inherently comprises applying the electric field at a constant voltage since the power

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source must constantly generate power or voltage to the ion source in order to generate plasma.

In regard to Claim 37, Koloc discloses that the applying the electric field comprises applying an electrical pulse across the weakly-ionized plasma (e.g. intensive pulsed electric field to produce a high stressed voltage condition. See Col. 14, lines 27-56).

In regard to Claim 41, Koloc discloses that generating a magnetic field (flux 34) proximate to the weakly-ionized plasma, the magnetic field trapping electrons in the weakly-ionized plasma.

In regard to Claim 43, Koloc discloses an apparatus for generating a strongly-ionized plasma, the apparatus comprising:

- means (gas source 88 in figure 9) for ionizing a volume of feed gas to form a weakly-ionized plasma;
- means (12, 14 in figure 8) for applying an electrical pulse across the weakly-ionized plasma to generate the strongly-ionized plasma; and
- means (16 in figure 8) for exchanging the strongly-ionized plasma with a second volume of feed gas (from gas source 88) while applying the electrical pulse across the second volume of feed gas to generate an additional strongly-ionized plasma (intensive pulsed electric field to produce a high stressed voltage condition. See Col. 14, lines 27-56).

In regard to Claim 44, Koloc discloses an apparatus for generating a strongly-ionized plasma, the apparatus comprising:

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- means (gas source 88 in figure 9) for ionizing a feed gas to generate a weakly-ionized plasma proximate to a cathode (14 in figure 8); and
- means for applying an electric field across the weakly-ionized plasma in order to excite atoms in the weakly-ionized plasma and to generate secondary electrons from the cathode, the secondary electrons ionizing the excited atoms, thereby creating the strongly-ionized plasma (intensive pulsed electric field to produce a high stressed voltage condition. See Col. 14, lines 27-56 and Col. 5, line 53 to Col. 6, line 6).

Claim Rejections – 35 U.S.C. 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koloc (5,041,760).

In regard to Claim 16, Koloc discloses the rise time is extremely fast (See col. 5, lines 19-21 and 35-35) but fails to disclose it being between about 0.1 microsecond and 10 seconds. However, since electrons flow (current stroke) very fast that is certainly faster than 10 seconds speed which is in the claimed range. Since 10 seconds is very slow.

Allowable subject matter

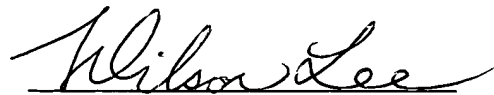
Claims 25, 27-30, 34, 38-40, 42 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hilliard (6,488,825) discloses a optically coupled sputter apparatus. Czernichowski et al. (5,993,761) discloses a plasma assistance device to steam reforming.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Wilson Lee whose telephone number is (703) 306-3426. Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center receptionist whose telephone number is (703) 308-0956. Any transmission not to be considered an official response must be clearly marked "DRAFT". The Technology Center Fax Center number is (703) 308-7722 or (703) 308-7724.



Wilson Lee
Patent Examiner
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